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United States Government **Department of Energy**

memorandum

DATE: July 26, 2001

REPLY TO ATTN OF: SC-13

SUBJECT: Update to the Spallation Neutron Source Project Execution Plan

TO: Energy Systems Advisory Board Members

The Project Execution Plan (PEP) for the Spallation Neutron Source (SNS) project has again been updated (Revision 3) and it is hereby provided for information to all regular members of the Energy Systems Acquisition Advisory Board.

The SNS PEP is structured as a Base Document (approved by the Acquisition Executive), an Appendix A (approved by the Director, Office of Science), and an Appendix B (approved by the Federal Project Manager). In particular, the attached Base Document has been updated to reflect:

- Change in title for the leader of the project's M&O contractor's organization from "SNS Executive Director" to "SNS Project Director" and "ORNL Associate Laboratory Director for SNS";

- Latest revision of DOE Strategic Plan (September 2000);

- Clarification of technical risk in Section 2.3 with respect to availability, reliability, and upgradability;

- Current site layout plan (Figure 1);

- Change in titles of the DOE Argonne and Brookhaven "Groups" to "Area Offices;"

- Change in the title of WBS 1.10 from "Operations" to "Pre-Operations;"

- Change in CD-4 approval authority from Secretary of Energy to Deputy Secretary of Energy (Senior Acquisition Executive) in accordance with DOE Order 413.3;

- Revised Project Summary Schedule to reflect a Level 1B baseline change that adjusted a number of interim project milestone dates; and

- Minor change in annual funding profile to account for a $512,000 rescission in FY 2001 which is recovered in FY 2003 per the President's FY 2002 Budget Request;

The Level 0 baseline parameters of Total Project Cost ($1,411.7 million) and project completion date (June 2006) have remained unchanged.

Appendices A and B have been updated to reflect recent Level 1A/B and 2 baseline changes approved by the respective control authority. The entire PEP can be accessed via the SNS Project Web Site at: www.sns.gov.

If you have any questions regarding this material, feel free to call Jeff Hoy (Headquarters Program Manager, SC-13) at (301) 903-4924, or Les Price (Federal Project Manager) at (865) 576-0730.

James F. Decker
Acting Director
Office of Science

Attachment

SPALLATION NEUTRON SOURCE

ACQUISITION EXECUTIVE

PLANS AND CONTROLLED ITEMS

Revision 3
July 10, 2001

The contents of the following PEP base document section are under the purview and control of the DOE Acquisition Executive, who must approve and sign all changes.

SPALLATION NEUTRON SOURCE
PROJECT EXECUTION PLAN

1. INTRODUCTION

1.1 PEP Structure and Use

The Spallation Neutron Source (SNS) is a U.S. Department of Energy (DOE) Major System project that is being carried out as a partnership among six DOE national laboratories to design and build a world-class user facility for research in neutron science. The national laboratories in the SNS partnership are Oak Ridge (ORNL), Argonne (ANL), Brookhaven (BNL), Lawrence Berkeley (LBNL), Los Alamos (LANL), and Thomas Jefferson National Accelerator Facility (Jlab). This partnership approach is being used to efficiently take advantage of each laboratory's specific technical expertise to provide the best possible facility to the neutron research community. The Project Execution Plan (PEP) for the SNS provides overall guidance to the various project participants on the roles, responsibilities, and management interactions among the DOE Office of Science (SC), the DOE Oak Ridge Operations Office (ORO), and the national laboratories involved in the SNS partnership, and their local DOE operations offices. It also documents the basis for managing the SNS partnership, and specific implementing mechanisms may be revised as experience is gained.

This PEP documents plans for project execution, including mission need and justification; project objectives and description; management systems; environment, safety, health and security; resource planning; transition to operations; project controls (management, baselines, and change systems); and reporting. The document is structured in parallel with the fundamental levels of management for DOE Major System projects. It consists of a base document that establishes the "first principles" for SNS project execution and specific baseline elements that are approved and controlled by the Acquisition Executive. Also included are appendixes for management, implementation, and control of the project, which are approved and controlled by the Director, Office of Science [Headquarters (HQ)]; the SNS DOE Project Manager (ORO); and the SNS Project Director, respectively. This hierarchy of documents (base through appendices) provides increasing detail on how the top-level guidelines and controls will be implemented and establishes the specific baseline elements controlled by successive levels of management. The most recent project data sheet is included as Appendix D.

The SNS PEP serves three basic functions. First, it describes the management and project execution processes that have been approved by DOE management. In short, the PEP constitutes the authorizing document for the "way of doing business" on the project. Second, the PEP establishes the project baselines (technical, schedule, and cost) against which project execution will be measured. Changes to project execution will be evaluated in terms of baseline impacts, and through graduated change control authority, appropriate levels of management become involved in decisions regarding project changes. Third, the PEP serves as the primary reference document for all levels of the project team. Technical requirements, policies, and procedures for resource allocation, procurement, budgeting and finance, work authorization, management, reporting, reviews and evaluations, etc., all flow down from the PEP.

1.2 PEP Approval and Revisions

Initial approval of the SNS PEP occurred in December 1997 as an element of Critical Decision 2 (Approval of Baseline) by the Energy Systems Acquisition Advisory Board Acquisition Executive. The Acquisition Executive approved a subsequent update, November 1999, of the PEP that addressed a major revision to the contractor management team. DOE Program and DOE Project Manager approvals were obtained before submission to the Acquisition Executive for final approval. Revisions will be processed and approved by the corresponding management level (i.e., Acquisition Executive for base document and DOE Program Manager, DOE Project Manager, and SNS Project Director for Appendixes A, B, and C, respectively), with the next higher level being informed of changes. The PEP will be revised to reflect actual budgets and to incorporate other changes as required.

2. MISSION NEED AND JUSTIFICATION

2.1 Mission Need

Public Law 95-91, dated August 7, 1977, assigned responsibility to the DOE for ensuring a coordinated and effective administration of the federal energy policy and programs. In turn, the Office of Science is charged with maintaining the nation's competitiveness in scientific areas, including the conduct of long-term programs oriented to high-risk research and development with potentially high payoffs, which the private sector cannot reasonably be expected to undertake. One aspect of this mission is the design, construction, and operation of major national facilities for research. Public Law 102-486, "Energy Policy Act of 1992," under Section 2203, Supporting Research and Technical Analysis (a) Basic Energy Sciences (2) User Facilities states: "The Secretary shall carry out planning, construction, and operation of user facilities to provide special scientific and research capabilities, including technical expertise and support as appropriate, to serve the research needs of the Nation's universities, industry, private laboratories, Federal Laboratories, and others." This mission includes the development and application of neutron-based research. Neutrons are a unique and increasingly essential tool in broad areas of the physical, chemical, and biological sciences, as well as in new materials development. Facilities required to adequately support neutron research are, by nature, large and capital intensive, but they provide vital resources to large numbers (thousands per year) of individual research programs.

A new facility is needed to satisfy U.S. research requirements and to regain a competitive status with the European scientific community, which has been lost over the past 20 years. U.S. neutron sources are relatively old (reactor and spallation-based sources were built in the 1960s and 1970s, respectively), have had minimal upgrading and modernization, and are not well suited to the specific areas of research to which scientific investigation has evolved. In contrast, European facilities are greater in number, are newer, have undergone continuing upgrades, and have new state-of-the-art reactor and spallation-based sources planned or under construction. This disparity of facilities has been recognized by every national panel that has reviewed the status of neutron sources and science in the United States. In 1977, the National Research Council of the National Academy of Sciences (NAS) published "Neutron Research on Condensed Matter," which recommended a high-flux, pulsed spallation source. In 1984, the NAS reviewed the needs for major facilities, and in the report, "Major Facilities for Materials Research and Related Disciplines" (Seitz-Eastman Committee) recommended (1) construction of a new high-flux, steady-state neutron source and (2) development of a plan leading to a high-intensity pulsed neutron facility. Recommendations of the Seitz-Eastman Committee were reaffirmed in 1993 by a Basic Energy Sciences Advisory Committee (BESAC) Panel on Neutron Sources for America's Future, the Kohn Committee. Following cancellation of the proposed Advanced Neutron Source (ANS) reactor project, BESAC convened another panel in 1996 to reevaluate the need for neutron facilities in the United States, and this panel strongly recommended that a 1-megawatt (MW) pulsed spallation source that could be upgraded be given the highest construction priority. In response, the SNS was conceived and the corresponding Approval of Mission Need, Critical Decision 1, was signed by the Acquisition Executive on August 19, 1996.

2.2 DOE Strategic Plan

The goal of the Science Business Line in the DOE Strategic Plan (September 2000) is to:

> *"Advance the basic research and instruments of science that are the foundations for DOE's applied missions, a base for U.S. technology innovation, and a source of remarkable insights into our physical and biological world and the nature of matter and energy."*

Construction of the SNS neutron research facility is entirely consistent with this goal in that it will provide a necessary "tool" for advancing the frontiers of science relevant to DOE's missions and U.S. technology innovation. Furthermore, completion of the SNS project is identified as a performance measure in achieving Science Objective SC4:

> *"Provide the extraordinary tools, scientific workforce, and multidisciplinary research infrastructure that ensures success of DOE's science mission and supports our Nation's leadership in the physical, biological, environmental, and computational sciences.*

Advanced materials developed through research at the SNS may also benefit other DOE Business Lines. For example:

Energy Resources

Promote reliable, affordable, clean, and diverse domestic fuel supplies. (Objective ER1)

Promote reliable, affordable, and clean transformation of fuel supplies into electricity and related products. (Objective ER2)

Increase the efficiency and productivity of energy use, while limiting environmental impacts. (Objective ER3)

2.3 Project Goals and Risks

Basic goals of the SNS project are to design, construct, and commission into operation the world's best accelerator-based pulsed neutron research facility to serve the mission needs of DOE and the scientific community by June 2006 and at a cost of $1,411.7 million (Total Project Cost). To complete the construction project (Critical Decision 4), it will be necessary to demonstrate that the accelerator system can deliver short (microsecond) pulses of high-energy protons that are accumulated in the ring and delivered to the target and that pulses of moderated neutrons produced by the spallation process will be delivered to beam transport systems for experiment applications.

The overall SNS design philosophy is to use low-risk technology, requiring minimum research and development, to achieve the facility's baseline performance while, at the same time, having significant upgrade potential. Use of high intensity proton beams for neutron production is a proven technology, and well understood; however, extending that technology to achieve a factor of ten more neutron flux than presently available imposes some technical risk. It is generally agreed that achieving approximately 1 MW beam power on target involves little technical risk, but achieving higher powers, in the 2 MW range, is a challenging multi-year program that will occur after project completion. In addition, while use of superconducting radiofrequency accelerating cavities for electrons is a proven technology, there is limited experience with protons. Development and testing of prototype cavities will minimize the technical risk for the SNS linac. Reliability and availability, comparable to 3rd generation light sources, is a further challenge. Overall plant reliability, availability, and maintainability will be enhanced through an effective systems engineering effort, including extensive verification using models, prototype simulations, and post-construction testing.

2.4 Alternatives

Alternatives for meeting neutron source needs and the considerations of those alternatives are summarized as follows:

Upgrade Existing Facilities—Upgrades to the two existing U.S. spallation source facilities have been carefully studied. The Intense Pulsed Neutron Source (IPNS) is generally believed to have reached its maximum potential, and at a power level of less than 10 kW, it is clearly inadequate to meet future needs for high fluxes of pulsed neutrons. The Los Alamos Neutron Science Center (LANSCE) has greater potential for upgrading and is in fact currently undergoing several phases of a major upgrade program that will bring its performance up to the level of ISIS, around 200 kW. Again, however, it will not be possible to upgrade the LANSCE facility to reach the 1- to 2-MW level. The upgrade of LANSCE is viewed as an essential step to provide neutrons to DOE and the science community while a new state-of-the-art source is constructed.

Purchase "Time" on European Facilities—Neutron source facilities in Europe are already oversubscribed by scientists from the owner nations; the purchase of time by U.S. users displaces the facilities' own constituents. Further, with the perception that successful U.S. research conducted at those facilities would, in effect, place the Europeans at a competitive disadvantage in the market place, there is little incentive for selling time to the United States, and there would always be the risk of our future access being denied. It should be mentioned that in these research facilities, the actual purchase of time is usually reserved for proprietary research, which is directly related to industrial competitiveness; foreign facilities are not inclined to support this type of work by U.S. industry. Open research by U.S. scientists with peer-reviewed proposals can compete on even ground with local researchers; however, as has been stated, these foreign facilities are heavily oversubscribed and the rate of approval of new experiments is not as high as is required to maintain a strong research base in the United States. The Europeans, in fact, have active programs to upgrade their existing sources and construct new ones to meet anticipated future needs.

Build a New, High-Powered Pulsed Spallation Source—This course satisfies the highest priority recommendations by recent BESAC panels (Kohn Committee report of January 1993 and BESAC report of March 10, 1997) reviewing neutron science and provides a world-class facility for neutron research.

Given the alternatives discussed previously, DOE is pursuing design and construction of a pulsed source (the SNS) at Oak Ridge, Tennessee. A final SNS Environmental Impact Statement (DOE/EIS-0247, April 1999) was prepared and issued that evaluated the impacts of constructing and operating SNS at DOE's preferred site (ORNL) and three alternative sites (ANL, BNL, and LANL). DOE issued a Record of Decision in June 1999 that announced its decision to proceed with construction and operation of the SNS facility at ORNL.

3. PROJECT DESCRIPTION

The SNS is designed to serve as an accelerator-based source of pulsed neutrons. An intense beam of protons, composed of many short-duration pulses, will be directed onto a target of high-atomic-number material (liquid mercury) to produce pulses of neutrons through a nuclear reaction called spallation. The neutrons will then be moderated (slowed) down to energies suitable for neutron-scattering research and be directed through transport systems to experimental stations containing instruments designed to maximize the scientific output of the facility. The facility is designed to meet requirements to ensure high reliability and availability for the user programs and includes the necessary support facilities to ensure excellent scientific productivity. A further description of the project is given in Appendix B, and a schematic representation of the facility is depicted in Figure 1.

4. MANAGEMENT SYSTEMS

4.1 Organization and Responsibilities

At the project's inception in FY 1997, DOE assigned overall responsibility for planning and execution of the SNS project to the management and operating (M&O) contractor of ORNL. To accomplish this task, an SNS Project Office was established to lead and apply the best available expertise from the partner laboratories (now six). The SNS team is ultimately responsible for all R&D, Title I and II design, construction, and commissioning of the SNS. Despite its relative complexity, this approach offers significant advantages to DOE as well as the participating laboratories. This section outlines the project's organization and management approach.

A schematic representation of the management arrangement is shown in Figure 2. In addition to the direct DOE interactions with the participating laboratories, it is essential to coordinate and maintain communications among the local DOE operations offices overseeing each of the laboratories. The solid lines in Figure 2 represent the flow of responsibility in the partnership, and the dotted lines indicate where communication, coordination, and support is required.

4.1.1 DOE Program Manager

Authority and responsibility for managing the Department of Energy programs and facilities resides with the Secretary of Energy. The Office of Science has been delegated responsibility for comprehensive, long range, basic energy-related research, including state-of-the-art research facilities, crucial to achieving goals described in the National Energy Strategy and the Department's Strategic Plan. The Office of Science provides overall program policy and guidance, technical oversight, and budgets for implementing its assigned role. Specific responsibility for design, construction, and operation of the SNS is assigned to SC's Office of Basic Energy Sciences (SC-10), with day-to-day program management performed by the SNS Program Manager in the Division of Material Sciences and Engineering (SC-13).

The DOE SNS Program Manager's roles and responsibilities are summarized as follows:

- define programmatic mission requirements and objectives;
- function as DOE HQ's point-of-contact for project matters;
- budget for funds required to execute the project;
- control changes to project baselines; and
- foster the community of users.

Because LANL is a key participant in the SNS and because LANL reports to the Office of the Deputy Administrator for Defense Programs (DP) within the DOE National Nuclear Security Administration, SC established a memorandum of agreement (MOA) documenting understandings with DP to facilitate LANL's participation.

Additional information on the SC role in management and execution of the SNS project, as well as the SC/DP MOA, can be found in Appendix A.

The Spallation Neutron Source Project

Figure 1. SNS Schematic Representation.

SUMMARY ORGANIZATION

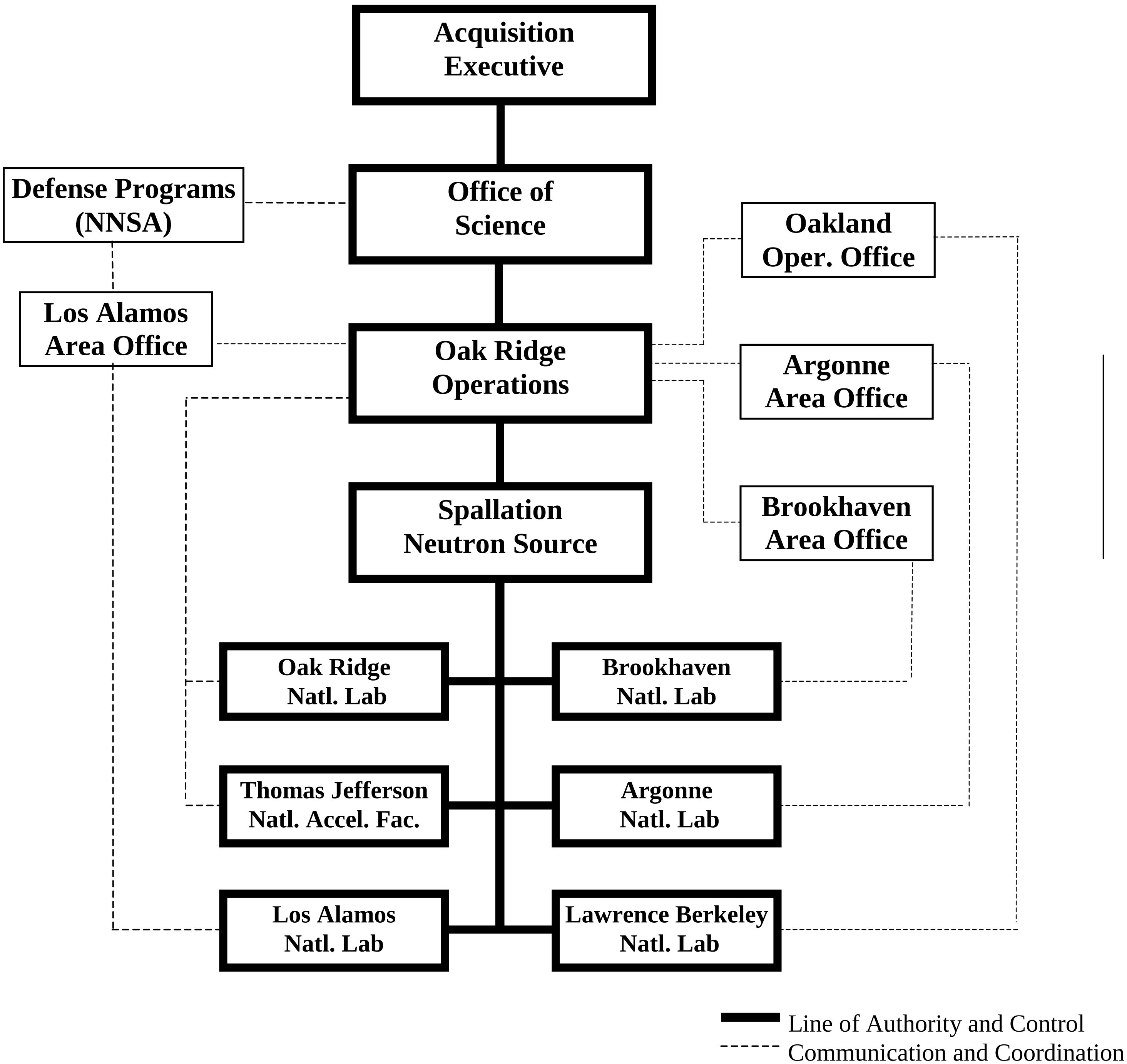

Figure 2. SNS Management Summary.

4.1.2 DOE Project Manager

The DOE Headquarters program manager implements the SNS project through a local field organization. The manager of ORO has been delegated line management responsibility and authority for carrying out the SNS project in a manner consistent with this PEP. The ORO Manager, through the Assistant Manager for Laboratories, has established and staffed an SNS project office under a DOE Project Manager, who has delegated responsibility and authority for project execution. Additional support to the SNS DOE Project Office will be provided by ORO matrix organizations at the level required for project success.

The SNS DOE Project Manager carries out the duties of field implementation of the SNS project. Roles and responsibilities are summarized as follows:

- administer the M&O contract on behalf of the contracting officer’s representative for matters pertaining to the SNS project;
- function as the field point of contact for the SNS project;
- maintain effective communications among SC, ORO, SNS, and among the other cognizant DOE site offices;
- provide project baselines to SC and monitor progress against them;
- comply with applicable Environmental, Safety, & Health requirements;
- submit appropriate National Environmental Policy Act (NEPA) documents;
- ensure that project R&D supports the design and safety analyses;
- submit budgets to SC for funds required to execute the project;
- ensure that the contractor designs and constructs a facility meeting mission requirements;
- maintain cognizance of project activities, anticipate potential problems, and take corrective actions to minimize project impacts;
- control changes within established authority to project baselines and seek HQ approval for changes beyond the DOE project manager’s authority;
- ensure adequate facility and construction safety; and
- provide regular reports to HQ and ORO on project status.

ORO has established, and will update as necessary, interface agreements with each of the DOE site offices responsible for managing the partner laboratories to ensure good communications, efficient administrative support, and contractor accountability for performing SNS project work.

Additional information on DOE ORO management and operations and interfaces with other DOE site offices is contained in Appendix B.

4.1.3 SNS Project Director

The DOE Project Manager implements the SNS project through the M&O contractor for ORNL, currently UT-Battelle, LLC, which is responsible for overall project coordination, execution, and eventual facility operation. The SNS Project Director has been tasked with line management responsibility and authority for carrying out the SNS project in a manner consistent with this PEP. The SNS Project Director leads and manages the SNS partnership as the means to accomplish the SNS project. The SNS partnership has been established with full cooperation of the participating laboratories, and appropriate leadership positions have been established and filled at each of the participating laboratories, with responsibility for completing their part of the SNS project and integrating it into the completed facility. The SNS Project Director also serves as the ORNL Associate Laboratory Director for SNS.

The SNS Project Director is responsible for the overall successful execution of the SNS project, including:

- executive level management of the design, construction, and transition to operations of the SNS facility to ensure all mission requirements are fulfilled in a safe, cost-efficient and environmentally responsible manner;
- primary responsibility to work with the scientific user community to ensure the SNS meets user needs; provide leadership to the neutron scattering community to develop new opportunities in neutron science and its applications;
- exercise full financial authority and accountability as delegated by DOE to develop budgets and control SNS work within approved baselines, and control changes to approved baselines in accordance with established configuration management procedures;
- manage and direct procurements within the authority delegated by DOE, including the authority to execute and deliver contracts, agreements, teaming agreements, purchase orders, assignments, and instruments and documents of any kind relating to the acquisition, sale, or disposition of products, services, materials, supplies, and equipment relating to and necessary and desirable for completion of the SNS;
- overall responsibility to hire and manage the human resources necessary to complete the SNS project and ensure an effective transition to operations, including the overall responsibility for managing the human resources systems within the authority delegated by DOE;
- maintaining a relationship with the European and Japanese neutron communities which are designing and operating similar facilities, to keep informed of current progress and developments of potential significance to the SNS.

Additional information describing the organization, management responsibilities, and operations of the SNS project is given in Appendix C.

4.2 Interactions and Interfaces

Essential interactions and interfaces needed to effectively manage the SNS project are defined in the preceding roles and responsibilities. Because this project differs from the typical approach to designing and constructing a major DOE facility, it is important that all participants embrace the intent of the interactions.

The primary interfaces occur both among the DOE offices and among the laboratory participants. The SNS is an SC construction project that involves national laboratories reporting through both SC and DP. Consequently, SC and ORO lead the establishment and maintenance of necessary agreements with DP and the affiliated laboratory DOE offices, and SNS will lead the establishment of agreements among the partner laboratories consistent with guidance from SC and ORO. The simplest possible interface mechanisms will be established based on prior experience of all the participants having worked together on other activities and projects.

4.3 Basis for Agreements

An agreement between DOE SC and DP was established and documented by SC (see the MOA in Appendix A).

An agreement between DOE ORO and the DOE site offices was established and documented by ORO (see the MOA in Appendix B).

An agreement among the collaborating DOE national laboratories was established and documented by SNS (see the MOA in Appendix C).

4.4 Work Breakdown Structure

The SNS project summary work breakdown structure (WBS) is shown in the following diagram (Figure 3):

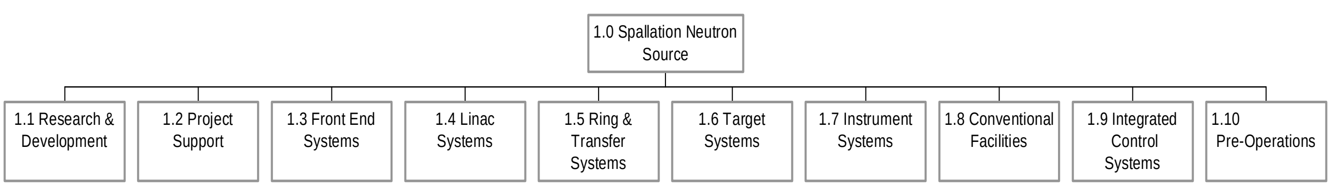

Figure 3. Summary WBS Diagram.

- **1.1 Research and Development**—The R&D necessary to support the project.
- **1.2 Project Support—**Administrative and managerial activities that integrate across the entire project, such as management, regulatory compliance, quality assurance, etc.
- **1.3 Front-End Systems**—Ion source for H-beam; low- and medium-energy beam transport lines (LEBT, MEBT), radio frequency quadrupole (RFQ) accelerator, beam-chopping systems, and required support systems.
- **1.4 Linac Systems**—Drift-tube linac (DTL), warm coupled-cavity linac (CCL) and cold cryomodule sections, radio frequency (rf) drive systems, beam diagnostics, support systems, and MEBT chopper.

- **1.5 Ring and Transfer Line Systems**—High-energy beam transport (HEBT) from linac to ring, injection/extraction systems, accumulator ring systems, transport to target station, beam cleanup and scraper systems, and required support systems.
- **1.6 Target Systems—**Target and moderator systems required to produce suitable neutron pulses, their required support systems, beam transport, the linac and ring tune dumps, and the neutrals dump.
- **1.7 Instrument Systems**—Instrumentation and equipment associated with SNS facility research.
- **1.8 Conventional Facilities**—Preparation of the site, design and construction of buildings, and provision of all utility systems.
- **1.9 Integrated Control Systems**—Development, procurement, and installation of the integrated plant control system.
- **1.10 Pre-Operations**—Materials, equipment, services, etc., required for commissioning.

4.5 Acquisition Strategy

DOE shall acquire design, construction, and operation of the SNS through effective use of performance-based contracting techniques.

Efforts will be made to encourage participation of females, minorities, and small/disadvantaged businesses (SDB) in execution of the SNS project.

4.6 Work Authorization

Mission Need (CD-1):
Authority—Secretary of Energy
On February 6, 1995, the President's Budget for FY 1996 terminated the previously proposed reactor-based neutron source, the ANS, in favor of a lower-cost SNS, and in October 1995 the Energy and Water Development Appropriations Act, FY 1996, including funds for R&D and conceptual design of the SNS was enacted. With these appropriated funds, conceptual design and other activities, such as the NEPA process, were begun in November 1995. DOE assumed full management responsibility for the project through preparation of a formal Justification of Mission Need, which was approved by Secretarial Decision Memorandum on August 19, 1996.

Baseline Approval (CD-2):
Authority—Secretary of Energy
Technical, schedule, and cost project baselines and change control thresholds are defined in Sect. 8, "Project Baselines and Change Control Thresholds," of this PEP. These baselines were developed based on the Conceptual Design Report (CDR), which was issued on May 30, 1997. On December 23, 1997, the secretary approved CD-2 (approval of Level 0 baselines), and the first PEP.

Construction Start (CD-3):
Authority—Director, Office of Science
SNS construction activities evolve sequentially, starting with site preparation and followed by long lead hardware procurements and excavation, etc. Based on a formal recommendation to proceed by the DOE Project Manager, the Director of SC signed a Decision Memorandum approving CD-3 on November 19, 1999.

Acceptance/Completion (CD-4):
Authority—Deputy Secretary of Energy
Following completion of construction, there will be a period of commissioning and performance testing. When all capital facilities necessary to achieve proton power on target of at least 1 MW have been installed, certified to operate properly and safely, and lower tier baselines have been satisfied, the project and DOE managers will recommend facility acceptance.

4.7 Project Summary Schedule

A project summary schedule is shown in Figure 4. Control of changes to the schedule milestones are the responsibility of the Acquisition Executive, the DOE Program Manager, and the DOE Project Manager, respectively, as specified in Sect. 8, "Project Baselines and Change Control Thresholds," of this document.

4.8 Financial Management

4.8.1 Budgeting

Annual budget requests adequate to support the project baseline will be submitted each year. These requests will address operating, capital equipment not related to construction, and line item funds; will include an appropriate contingency; and will be the interdependent set of estimates required to manage and maintain the total project cost (TPC) of the project as identified in Sect. 8 of this report. Funds for constructing and operating the SNS will be directed to the SNS project in Oak Ridge, who will plan their distribution and transfer allocated funds to the participating laboratories.

4.8.2 Life-Cycle Cost

The project life-cycle cost reflecting the TPC for design and construction, operation for the 40-year design life, and eventual decommissioning is estimated to be $5.8 billion (costs escalated to 2006, then constant dollars thereafter).

4.9 Quality Assurance

A project quality assurance (QA) program in accordance with DOE requirements will be implemented.

4.10 Project Monitoring and Assessment

Real-time monitoring of the SNS project will occur through established mechanisms among project participants. Reviews of the project status will be conducted by SC, typically at semi-annual intervals, with results of these reviews provided to the Acquisition Executive. Formal project reporting is in effect for the duration of the construction project, in accordance with the reporting requirements identified in DOE O 413.3 and this PEP.

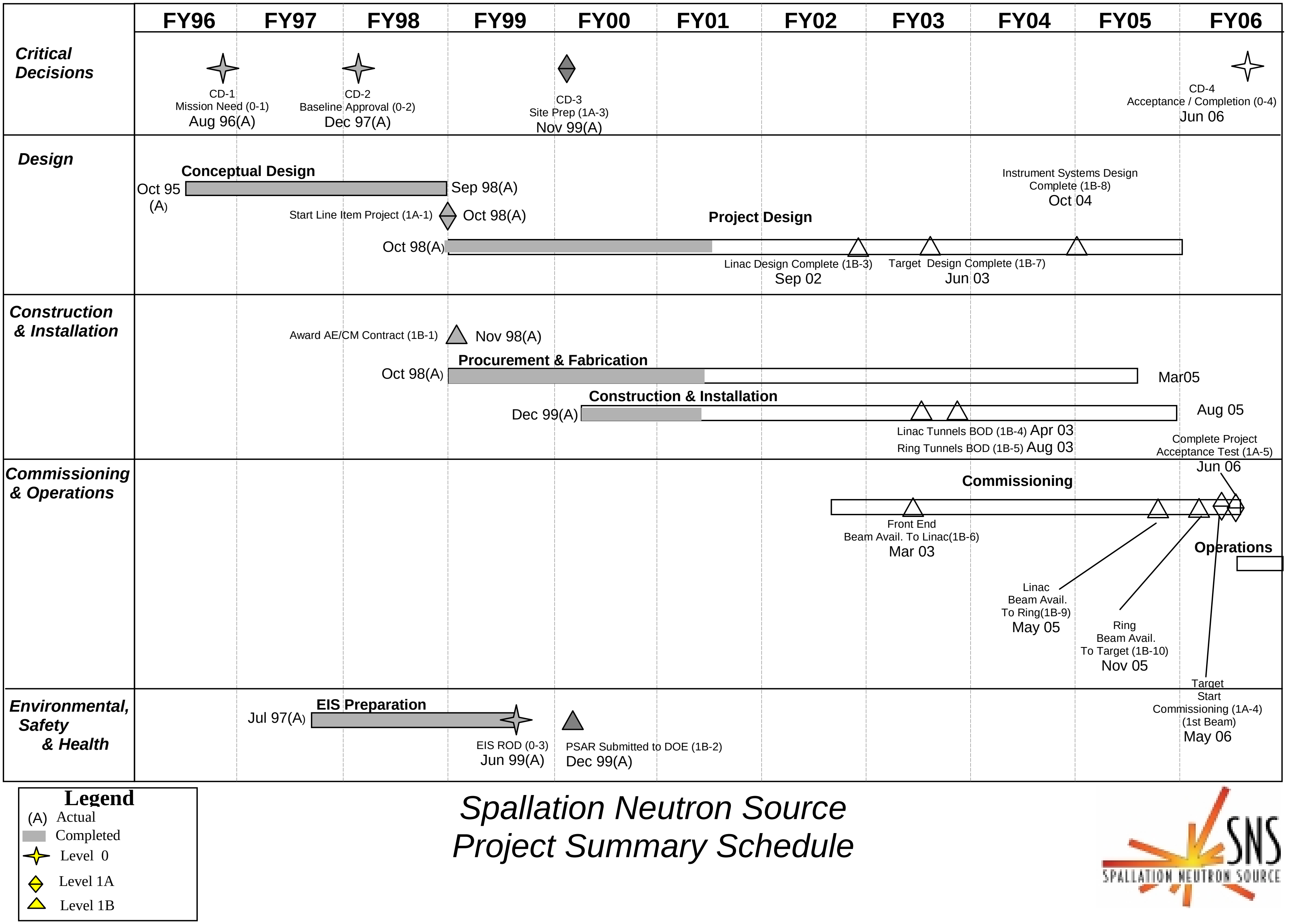

Figure 4. Summary Schedule

5. ENVIRONMENT, SAFETY, HEALTH, AND SECURITY

5.1 National Environmental Policy Act

Construction and operation of the SNS is a major federal action that required preparation of an Environmental Impact Statement (EIS). Accordingly, ORO prepared an EIS consistent with DOE Order 451.1A, the June 1996 Secretarial Policy Statement on NEPA, and Title 10, *Code of Federal Regulations*, Part 1021 (10 CFR 1021). The SNS Final EIS (DOE/EIS-0247) was distributed on April 15, 1999, and the Acquisition Executive issued a Record Of Decision (ROD) on June 18, 1999 to construct the SNS on the proposed ORNL site. The ROD was a prerequisite to commencing Title II design and awarding long-lead equipment procurements.

5.2 Plant Safety

A primary objective of the SNS project is to design and construct a facility that meets mission goals and that also protects the environment and the safety of workers and the general public. An integrated safety management system (ISMS) approach is being applied to the SNS project. The safety assessment process will comply with the “Work Smart Standards” that have been incorporated into the M&O contract.

5.3 Waste Minimization & Pollution Prevention

An objective of the SNS project is to minimize the amount of waste generated during the full facility life cycle (construction, operation, and decommissioning). This will be achieved through design choices that reduce the kinds and amounts of waste, by recycling materials to the extent feasible, and proper treatment or pretreatment of waste streams.

5.4 Construction/Industrial Safety

Safety of the workforce, safe transport and installation of components, and safe checkout and startup of the facility are prime project goals. Project participants will enforce safety requirements and rules. To the extent possible, commercial safety standards will be applied to facility construction activities.

6. RESOURCE PLANNING

Project Data Sheet

The total annual budget authority for the baseline presented in this PEP is summarized below, and it is consistent with the project’s FY 2002 data sheet (See Appendix D).

Prior	2001	2002	2003	2004	2005	2006	Total Project Cost
\$286.5 M	\$278.0 M	\$291.4 M	\$225.0 M	\$143.0 M	\$112.9 M	\$74.9 M	\$1,411.7 M

7. TRANSITION TO OPERATIONS

7.1 Facility Startup

Checkout, test, acceptance, and pre-operations of facility components will be addressed by appropriate planning for all aspects of bringing the individual components on line to support integrated operation of the complete facility, to address the operating procedures and maintenance requirements of the facility, and to provide the necessary technical personnel and operator training and qualification.

7.2 Lessons Learned

Near the conclusion of the project, lessons learned of "what went right" and "what went wrong," as well as insights into what might have been done better, will be studied and documented.

8. PROJECT BASELINES AND CHANGE CONTROL THRESHOLDS

ACQUISITION EXECUTIVE CONTROLS

	BASELINE (Level 0)	CHANGE THRESHOLD
SITING	Site: Oak Ridge, TN *(Selected by 6/18/99 Record of Decision)*	Siting change requiring a supplemental EIS
TECHNICAL SCOPE	Accelerator-based neutron scattering facility providing: ≥1 MW proton beam power on target.	Changes impacting level 0 scope
SCHEDULE	1. Critical Decision 1 (CD1) Mission need 8/96 (actual) 2. Critical Decision 2 (CD2) Baseline approval 12/97 (actual) 3. EIS Record of Decision (ROD) 6/99 (actual) 4. Critical Decision 4 (CD4) Acceptance/completion 6/06	Changes ≥ 6 months
COST	Total Project Cost $1,411.7 Million	Changes to the TPC